IN THE CLAIMS

The following claims have been presented previously with parenthetical status notations. An instruction line precedes each claim that is amended by the instant paper.

Please **cancel** claims 1-12 without prejudice.

1. (CANCELLED)

2. (CANCELLED)

3. (CANCELLED)

4. (CANCELLED)

5. (CANCELLED)

6. (CANCELLED)

7. (CANCELLED)

8. (CANCELLED)

9. (CANCELLED)

10. (CANCELLED)

11. (CANCELLED)

12. (CANCELLED)

Please **add** claims 13-28 as follows:

13. (NEW) A single electron tunneling transistor, comprising three conductive segments of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment.

14. (NEW) The single electron tunneling transistor of claim 13, wherein the conductive parts of DNA molecules are M-DNA conductive strands.

15. (NEW) The single electron tunneling transistor of claim 13, wherein the conductive parts of DNA molecules are Poly-G Poly-C conductive strands.

16. (NEW) The single electron tunneling transistor of claim 13, wherein the single electron tunneling transistors employ a hopping mechanism, for electron transferring between said DNA-based conductive elements, as a tunnel junction for a net charge.

17. (NEW) The single electron tunneling transistor of claim 16, wherein said hopping mechanism comprising a P-bridge as a tunnel junction for a net charge.

18. (NEW) A resistor, comprising:

a plurality of single electron tunneling transistors, each comprising three conductive segments of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment,

wherein the transistors have been serially connected and the resistor has a constant over-threshold gate voltage.

19. (NEW) A circuit, comprising:

a plurality of repetitive single electron tunneling transistors, each transistor comprising three conductive parts of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment; and

a NOT gate.

20. (NEW) The circuit of claim 19, wherein the NOT gate comprises a DNA-based transistor and a resistor.

21. (NEW) A circuit, comprising:

a single electron tunneling transistor;

a NOT gate; and

a resistor comprising a plurality of resistor single electron tunneling transistors in series having a constant over-threshold gate voltage,

wherein each single electron tunneling transistor and each resistor single electron tunneling transistor comprises three conductive parts of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment and the number of resistor single electron tunneling transistors is selected to give the resistor a desired resistivity.

22. (NEW) A circuit, comprising:

a plurality of repetitive single electron tunneling transistors, each transistor comprising three conductive parts of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment; and

a NOR gate.

23. (NEW) The circuit of claim 22, wherein the NOR gate is built from two DNA-based NOT elements, and wherein the output of the first DNA-based NOT element is connected to the resistor of the second DNA-based NOT element as its voltage supply.

24. (NEW) A circuit comprising a plurality of repetitive single electron tunneling transistors, each transistor comprising three conductive parts of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment.

25. (NEW) The circuit of claim 24, further comprising a clock.

26. (NEW) The circuit of claim 24, wherein the single electron tunneling transistors employ a hopping mechanism, for electron transferring between said DNA-based conductive elements, as a tunnel junction for a net charge.

27. (NEW) The circuit of claim 26, wherein said hopping mechanism comprising a P-bridge as a tunnel junction for a net charge.

28. (NEW) The circuit of claim 24 further comprising a resistor, comprising:

a plurality of single electron tunneling transistors, each comprising three conductive segments of DNA molecules connected to an active grain, wherein the active grain consists of a bare DNA segment,

wherein the transistors have been serially connected and the resistor has a constant over-threshold gate voltage.

29. (NEW) A method for manufacturing a circuit consisting of a collection of basic components, said basic components being selected from transistors, logical gates, and logical operations elements and memory registers, and comprising each a plurality of conductor strands and an active grain, said method comprising:

(a) For a given basic component

(1) Synthesizing a large population of DNA strands of different types, said types comprising one continuous main strand between the source and the drain of the transistor, two complementary strands for each side, one gate strand which has, at the active edge, a short sequence which is the complementary of the main strand middle part, and a complementary strand of the gate;

(2) Mixing the strands in a solution, and allowing them to combine;

(3) After completion of step 2) above, adding to the solution enzymes suitable to combine to the DNA and protect the coded edges and the active cores;

(4) Transforming the strands into current conductors by:

(a) mutating the strands into M-DNA; or

(b) implementing said strands with Poly-G Poly-C molecules;

(5) Removing, by standard biochemical methods, the protecting enzymes;

(b) After all the required basic elements are prepared, gradually constructing the circuit by starting at a junction in the circuit in which there is a single electron tunneling transistor, and adding double stranded molecules with exposed single stranded edges complementary to the coded edges of the single electron tunneling transistor;

(c) Continuing construction by adding the elements, which correspond to the other edges of the wires,

and adding more wire to be combine to the nuclei that have been generated until the network is completed; and

(d) Adding again enzymes suitable to protect the active cores of the elements, and coating the entire circuit.